

WHAT IS CLAIMED IS:

1. A lighting device for a lamp device, comprising:

a circuit board; and

film capacitors, packaged on the circuit board by using leadless flow solders,

5 wherein each film capacitor comprises polypropylene films and lead wires, and a material of the lead wires has a thermal conductivity lower than a thermal conductivity of copper, and terminals and internal materials of the film capacitors are leadless.

2. The lighting device of claim 1, wherein a diameter of the lead wires is 0.6ϕ (mm) or less.

10 3. The lighting device of claim 1, wherein a cross-sectional area of the film capacitors is 35mm^2 or less, and a temperature at a terminal end of the lead wires in the film capacitors during a soldering process is 130°C or less.

15 4. The lighting device of claim 1, wherein a length of the lead wires from the circuit board to the film capacitor is 2mm or more after the film capacitors are packaged onto the circuit board.

5. The lighting device of claim 1, wherein the film capacitors are constructed by a combination of a polypropylene film and an aluminum foil.

6. The lighting device of claim 1, wherein the film capacitors are constructed by an aluminum-deposited polypropylene film.

20 7. The lighting device of claim 1, wherein circuit elements set on the circuit board are all leadless.

8. An illumination apparatus, comprising:

a lamp; and

a lighting device for lighting the lamp,

25 wherein the lighting device comprises a circuit board; and film capacitors packaged on the circuit board by using leadless flow solders, wherein each film capacitor comprises polypropylene films and lead wires, and a material of the lead wires has a thermal conductivity lower than a thermal conductivity of copper, and terminals and internal materials of the film capacitors are leadless.

30 9. The illumination apparatus of claim 8, wherein a diameter of the lead wires is 0.6ϕ (mm) or less.

10. The illumination apparatus of claim 8, wherein a cross-sectional area is 35mm^2

or less, and a temperature at a terminal end of the lead wires in the film capacitors during a soldering process is 130°C or less.

11. The illumination apparatus of claim 8, wherein a length of the lead wires from the circuit board to the film capacitor is 2mm or more after the film capacitors are packaged onto the circuit board.

5 12. The illumination apparatus of claim 8, wherein the film capacitors are constructed by a combination of a polypropylene film and an aluminum foil, or an aluminum-deposited polypropylene film.

10 13. The illumination apparatus of claim 8, wherein circuit elements set on the circuit board are all leadless.

14. An illumination system, comprising:

lamps; and

at least one lighting device for lighting the lamps;

15 wherein the lighting device comprises a circuit board; and film capacitors packaged on the circuit board by using leadless flow solders, wherein each film capacitor comprises polypropylene films and lead wires, and a material of the lead wires has a thermal conductivity lower than a thermal conductivity of copper, and terminals and internal materials of the film capacitors are leadless.

16. The illumination system of claim 14, wherein a diameter of the lead wires is 0.6φ (mm) or less.

20 16. The illumination system of claim 14, wherein a cross-sectional area is 35mm² or less, and a temperature at a terminal end of the lead wires in the film capacitors during a soldering process is 130°C or less.

25 17. The illumination system of claim 14, wherein a length of the lead wires from the circuit board to the film capacitor is 2mm or more after the film capacitors are packaged onto the circuit board.

18. The illumination system of claim 14, wherein the film capacitors are constructed with a combination of a polypropylene film and an aluminum foil, or an aluminum-deposited polypropylene film.

30 19. The illumination apparatus of claim 14, wherein circuit elements set on the circuit board are all leadless.